

CBCS SCHEME



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18EC81

Eighth Semester B.E. Degree Examination, June/July 2024 Wireless and Cellular Communication

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain path loss modal for free space propagation. (06 Marks)
- b. Explain briefly three basic propagation mechanisms. (06 Marks)
- c. If a transmitter produces 50 W of power, express the transmit power in units of (i) dBm (ii) dBW. If 50 W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100 m from the antenna what is $P_r(10 \text{ km})$? Assume unity gain for the receiver antenna? (08 Marks)

OR

- 2 a. Distinguish between delay spread and coherence bandwidth. (06 Marks)
- b. Distinguish between Doppler spread and coherence time. (06 Marks)
- c. Explain the analysis of cellular systems. (08 Marks)

Module-2

- 3 a. Describe GSM protocols and signaling model with a neat diagram. (10 Marks)
- b. Explain the various logical channels used in GSM. (10 Marks)

OR

- 4 a. List out the ten operations in call set up in GSM system. Explain in detail authentication and ciphering mode operation. (10 Marks)
- b. Explain the intra BSC hand over operation in GSM. (10 Marks)

Module-3

- 5 a. Explain frequency planning issues for intersystems in CDMA. (08 Marks)
- b. Explain the network nodes found in CDMA 2000 wireless system. (12 Marks)

OR

- 6 a. Explain basic spectrum spreading operation in CDMA. (10 Marks)
- b. Explain the generation of the pilot channel signal. (10 Marks)

Module-4

- 7 a. List the advantages of OFDM leading to its selection for LTE and explain. (10 Marks)
- b. With a neat block diagram, explain LTE network architecture and describe briefly the new elements provided in it. (10 Marks)

OR

- 8 a. With the help of neat diagrams, explain how the timing and frequency synchronization is performed by the receiver to demodulate an OFDM signal. (12 Marks)
- b. What is PAR problem? Explain the methods used for PAR reduction. (08 Marks)

Module-5

- 9 a. Explain basic design principles followed in LTE specifications. (10 Marks)
- b. Explain downlink OFDMA radio resources. (10 Marks)

OR

- 10 a. Explain uplink SC-FDMA radio resources. (10 Marks)
- b. Explain the layers of LTE radio interface protocol. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8=50, will be treated as malpractice.

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